

ICS 43.020



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Road vehicles - Compressed natural gas (CNG) refuelling
connector**

(English Translation)

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1 Scope

This document specifies the general structure, instructions and marking requirements for CNG vehicle refueling connectors, and describes the test methods.

This document only applies to CNG vehicles with a service pressure of 20 MPa.

NOTE: unless otherwise stated, all pressures in MPa are gauge pressures.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 1690 Rubber, Vulcanized or Thermoplastic - Determination of the Effect of Liquids (GB/T 1690-2010, ISO 1817:2005, MOD)

GB/T 3512 Rubber, Vulcanized or Thermoplastic - Accelerated Ageing and Heat Resistance

Tests - Air-oven Method (GB/T 3512-2014, ISO 188:2011, IDT)

GB/T 10125 Corrosion Tests in Artificial Atmospheres - Salt Spray Tests (GB/T 10125-2021, ISO 9227:2017, MOD)

ISO 15500-2 Road Vehicles - Compressed Natural Gas (CNG) Fuel Systems Components - Part

2: Performance and General Test Methods

ISO 15501-1 Road Vehicles - Compressed Natural Gas (CNG) Fuel Systems - Part 1: Safety

Requirements

3 Terms and Definitions

The following terms and definitions are applicable to this document.

3.1

dry air

Air with a dew point temperature at the test pressure that is at least 11 °C lower than the ambient test temperature.

compatible with CNG within the working pressure and temperature range and shall not have any effect.

The working temperature is selected by the manufacturer based on the following temperature ranges:

---40 °C ~ 85 °C or -40 °C ~ 120 °C (if applicable);

---20 °C ~ 85 °C or -20 °C ~ 120 °C (if applicable).

NOTE 1: the lower limit temperature depends on whether the component is used in mild or cold weather.

NOTE 2: the upper limit temperature depends on whether the component is installed inside the engine compartment (120 °C) or outside the engine compartment (85 °C).

4.5 If the material of the CNG refueling nozzle and refueling receptacle is brass, the copper content shall be less than or equal to 70%, so as to ensure compatibility with natural gas and shall not have any effect.

4.6 The external three-way valves shall be clearly marked to indicate the open, closed and venting positions.

4.7 No tools shall be used to connect or disconnect the CNG refueling nozzle and refueling receptacle.

4.8 The refueling receptacle shall be installed on the vehicle in accordance with the requirements of ISO 15501-1.

4.9 The connecting components shall have good airtightness and shall not leak.

5.1 Types of Refueling Nozzle

5.1.1

The characteristics of the refueling nozzle shall comply with the requirements of Appendix B. Refueling nozzles are divided into the following three types.

a) Type-1 refueling nozzle is applicable to devices where the hose is under high pressure after the gas dispenser is turned off.

This type of refueling nozzle shall be equipped with an integrated valve or multiple valves. By closing the valve, gas refueling shall be stopped, and the remaining gas in the refueling nozzle shall be safely evacuated, then, the refueling nozzle is allowed to be disconnected from the refueling receptacle. Its operating mechanism shall ensure that the exhaust valve is opened before the evacuation action, and the gas between the refueling nozzle stop valve and the refueling receptacle needle valve has been safely discharged before removing the refueling nozzle (see 10.2).

b) Type-2 refueling nozzle is applicable to devices where the hose is under high pressure after the gas dispenser is turned off.

This type of refueling nozzle shall have a direct or indirect independent three-way valve in front of the air inlet, through which, the remaining gas in the refueling nozzle can be safely evacuated before removing the refueling nozzle. Gas refueling can only be performed when the refueling nozzle and refueling receptacle are correctly corrected. Before removing the refueling nozzle, deflate first (see 10.2).

c) Type-3 refueling nozzle is applicable to devices where the refueling hose has automatic pressure relief (less or equal to 0.5MPa) after the gas dispenser is turned off (see 10.2).

5.1.2

In accordance with cycle life, the refueling nozzles are divided into the following two types:

---Type A: high-frequency use type, whose cycle life should be no less than 100,000 times;

---Type B: low-frequency use type, whose cycle life should be no less than 20,000 times.

5.2 Before disconnecting, all types of refueling nozzles shall be exhausted or depressurized.

The disconnection of all refueling nozzles shall comply with the stipulations of 10.2.

5.3 The sealed connection between the refueling nozzle and the refueling hose shall not

rely solely on threads (for example, tapered threads).

5.4 The three-way valve exhaust port of Type-1 and Type-2 refueling nozzles shall be protected, so as to prevent foreign matters and fluids from entering and affecting the normal operation of the three-way valve.

5.5 The parts on the refueling nozzle that operate the connection or disconnection may be made of thermally insulating materials.

5.6 If Type-1 refueling nozzle contains a rotating mechanism, there shall be "open" and "closed" marks that permanently identify the direction of operation.

5.7 The surface hardness of the contact surface between the refueling nozzle and the refueling receptacle is greater than 75 HRB and shall be made of non-sparking and conductive materials (see 10.11.5 and 10.15). The outer surface of the refueling nozzle shall be made of non-sparking materials (see 10.11.5 and 10.15).

5.8 The refueling nozzle shall comply with the stipulations of Chapter 10, so as to ensure interchangeability.

c) B200;

d) Applicable types and categories (see 5.1);

e) Working temperature range.

9.3 The refueling nozzle and refueling receptacle shall be marked with a manufacturing date code.

9.4 Each system shall have identification consistent with this document, which may be located on the equipment, on the packaging, or in the documentation included in the equipment's exit- factory packaging.

10.1 General Requirements

10.1.1

The refueling nozzle and refueling receptacle under test shall comply with the stipulations of this document. The test shall be carried out under the following conditions:

- a) The test shall be conducted at an ambient temperature of $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$;
- b) All pressure or leakage test media shall be dry air or dry nitrogen;
- c) The device shall be adjusted to a balanced state.

The maximum deviation of all pressures and dimensions shall be $\pm 5\%$.

10.1.2

Adopt Type-2 refueling nozzles that use a three-way valve or other modes for independent